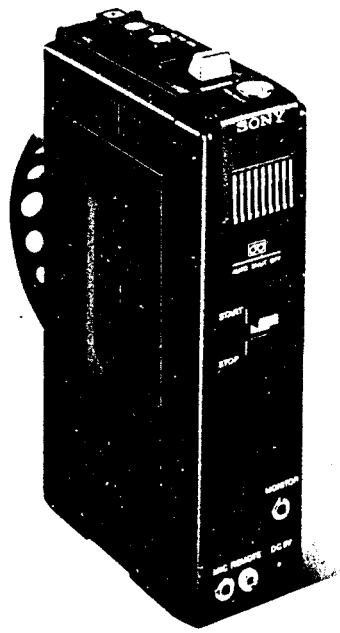
TC-42

E Model
USA Model
Canada Model
AEP Model



CASSETTE-CORDER

SPECIFICATIONS

Power Requirements:	DC 6 V with four penlight batteries, house hold current with an ac adaptor [AC-9 (USA and Canada), AC-456C (E and AEP)], rechargeable battery pack (BP-23) or 12 V dc with SONY car battery cord (DCC-126)
Track System:	Two-track mono
Tape:	SONY tape cassette or equivalent
Tape Speed:	1 7/8 ips (4.8 cm/s)
Recording Time: (with C-120 tape cassette)	2.0 hrs total
Frequency Response:	50 ~ 10,000 Hz
Wow and Flutter:	0.38 % (RMS) weighted
Power Output:	500 mW maximum
Record Bias Frequency:	Approx. 41 kHz

Input:	MIC input Impedance : low impedance Maximum sensitivity : 0.2 mV (−72 dB)
Output:	MONITOR output Impedance : 8 Ω or 10 kΩ load Output level : 0.775 V (0 dB) with 10 kΩ load
Speaker:	2 3/4" (70 mm) Dynamic speaker Voice coil impedance : 8 Ω
Semiconductors:	1 FET, 13 transistors and 8 diodes
Dimensions:	2"(W) x 7 5/16"(H) x 4 5/8"(D) (51 x 184 x 111 mm)
Weight:	2 lb 3 oz (0.98 kg) with four penlight batteries

SONY

SERVICE MANUAL

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When ordering replacement parts, you should use PART NUMBER listed on the Parts List or shown in the EXPLODED VIEW. The reference number should not be used for ordering purposes.

SECTION 1
OUTLINE

1-1. SERVO CONTROL CIRCUIT OPERATION

Stage/Control	Function
Frequency generator (FG)	This generator is coaxially coupled with dc motor. The frequency of FG varies in direct proportion to the motor rotation.
Discriminator Q101	Active high-pass filter consisting of Q101, C101, C102, R103, R104 and R108 discriminates the output of FG. When the input frequency increases, the output of the discriminator increases, or vice versa.

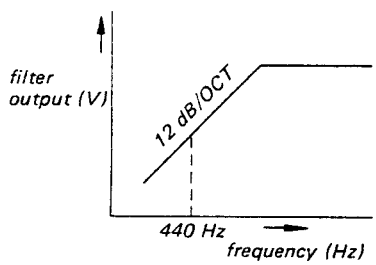


Fig. 1-1. Filter characteristics

Stage/Control	Function
Speed control R101	This control shifts the filter characteristics.

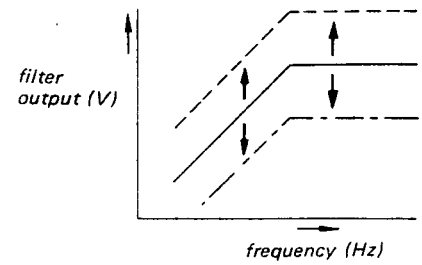


Fig. 1-2. Shift of filter characteristics

Voltage stabilizer D101	This diode stabilizes B+ voltage for Q101 and Q102.
Rectifier D102, D103	These diodes rectify the output of the discriminator as a voltage doubler.
Direct coupled dc amplifier Q102, Q103, Q104	This amplifier amplifies dc component rectified by D102 and D103 to control the motor current. Since the output from FG is not available when starting the motor, no dc component is applied to Q102 base to turn Q102 off. Since Q103 base voltage is high as B+ voltage, Q103 and Q104 are conductive to start the motor.

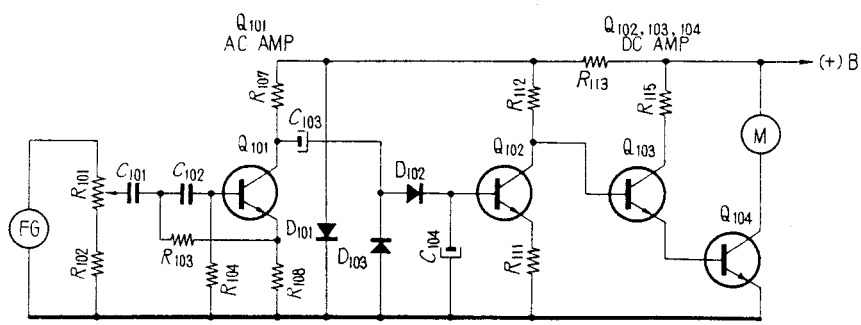
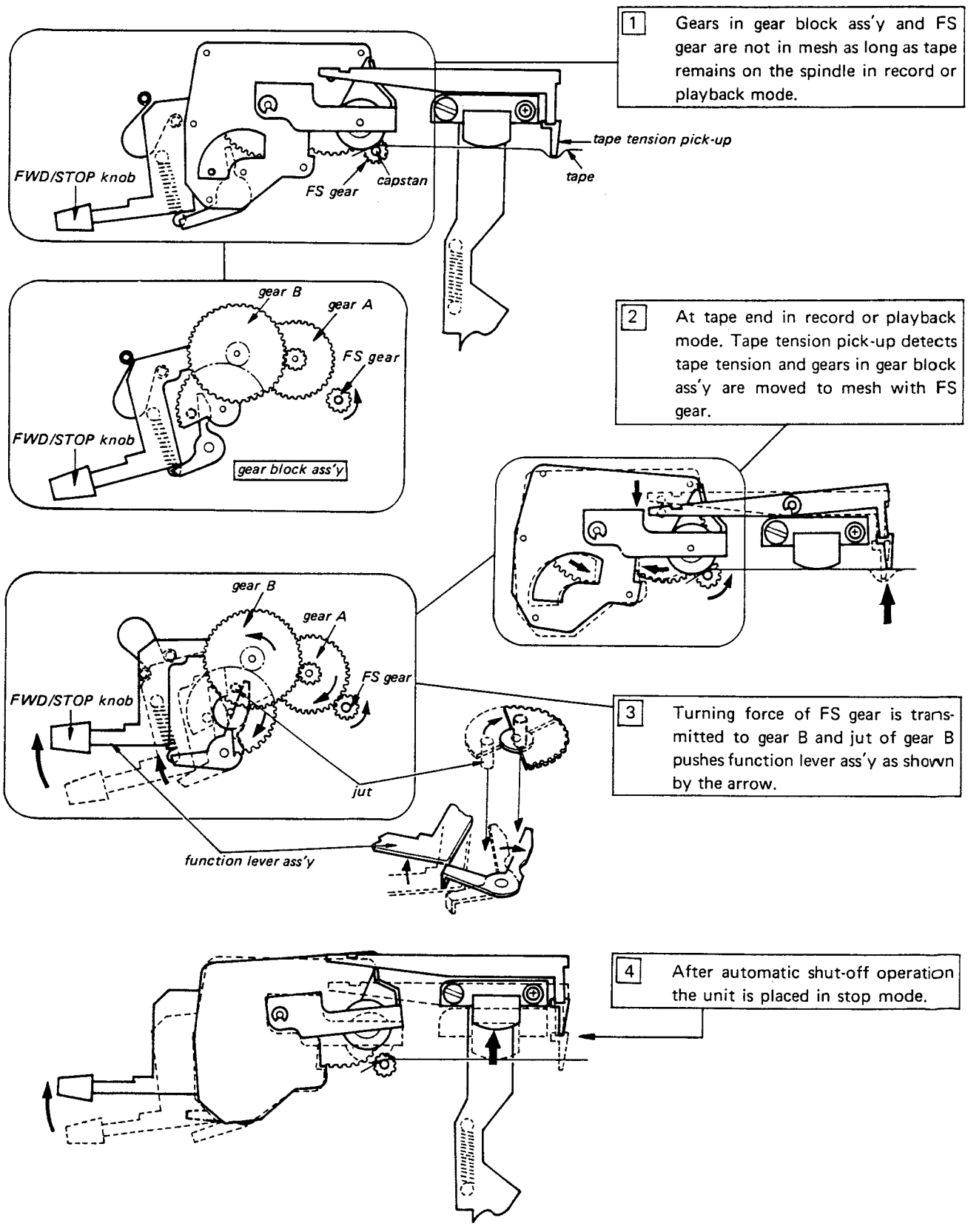


Fig. 1-3. Outline of servo control circuit

1-2. AUTO SHUT-OFF MECHANISM OPERATION

TC-42 mechanism is designed so that the unit will shut itself off automatically at tape end in record or playback mode.

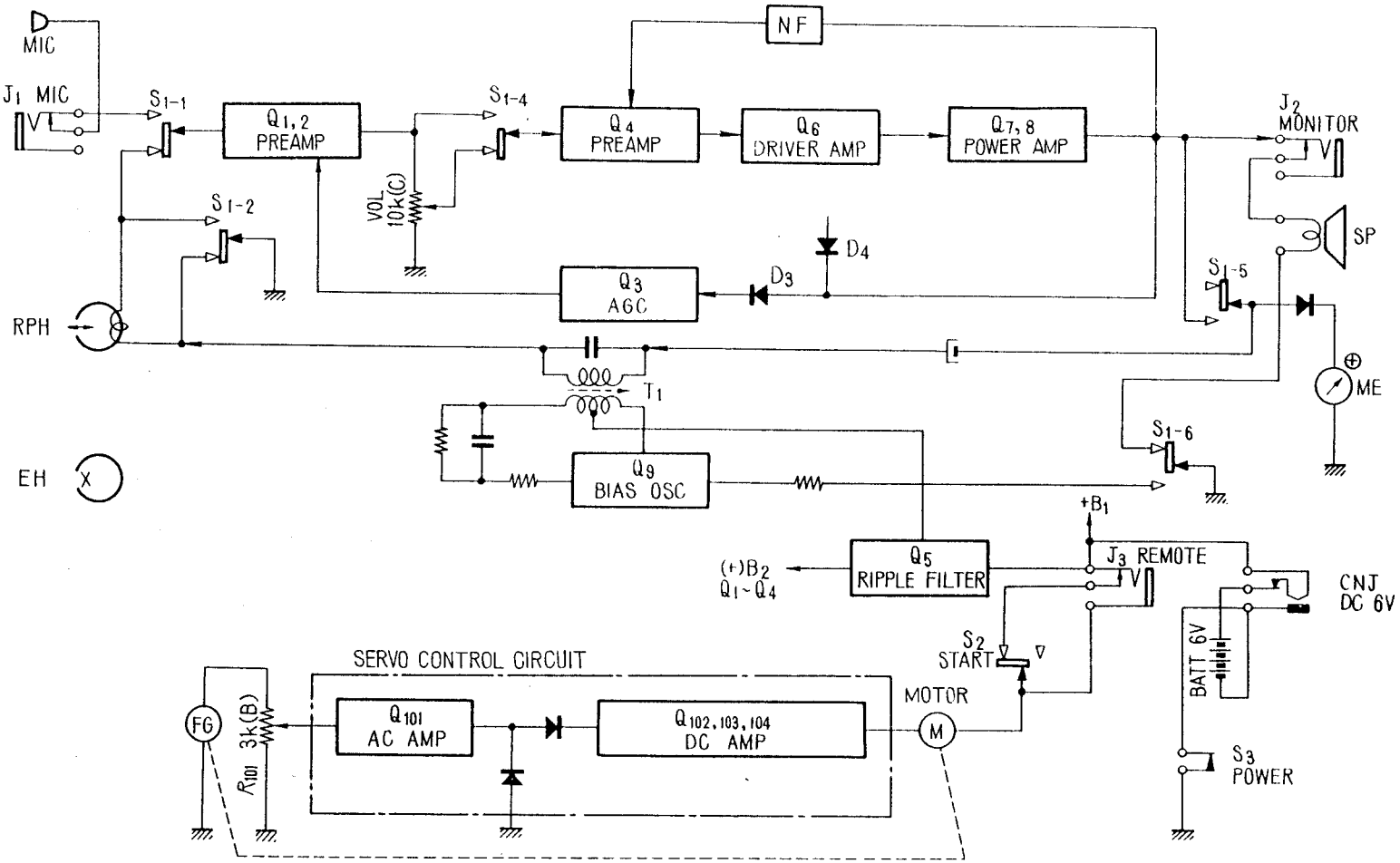


1 Gears in gear block ass'y and FS gear are not in mesh as long as tape remains on the spindle in record or playback mode.

2 At tape end in record or playback mode. Tape tension pick-up detects tape tension and gears in gear block ass'y are moved to mesh with FS gear.

3 Turning force of FS gear is transmitted to gear B and jut of gear B pushes function lever ass'y as shown by the arrow.

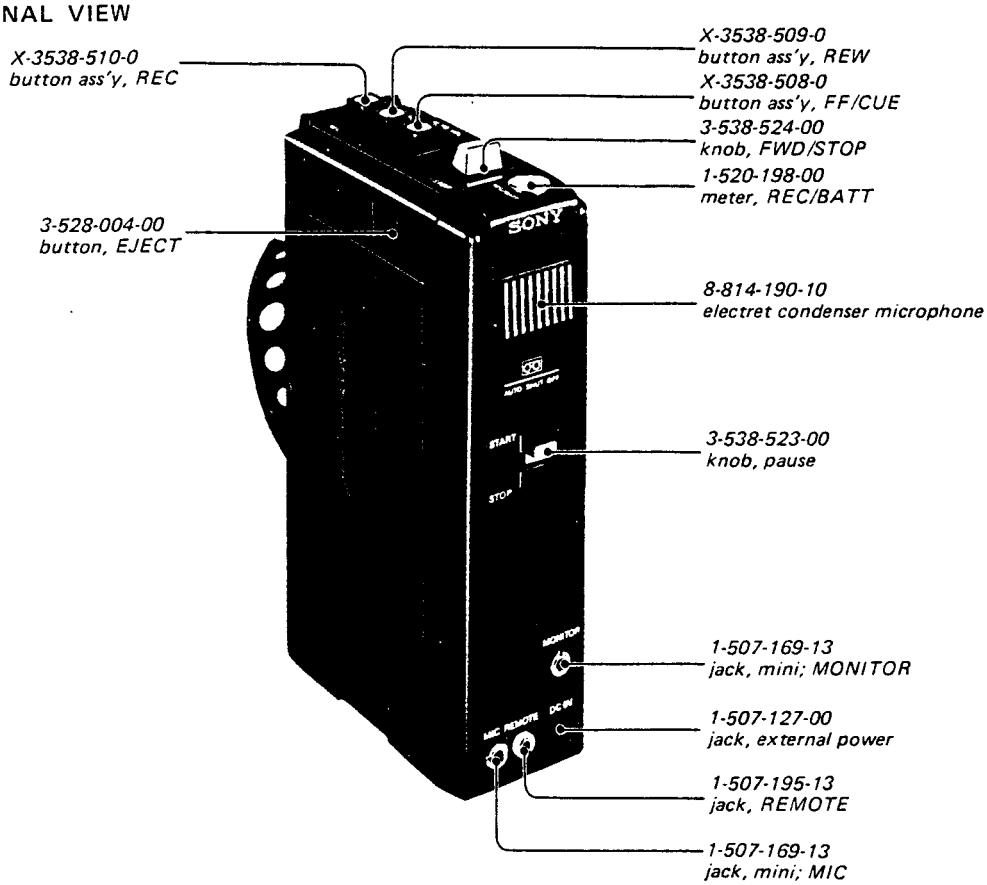
4 After automatic shut-off operation the unit is placed in stop mode.



Note:

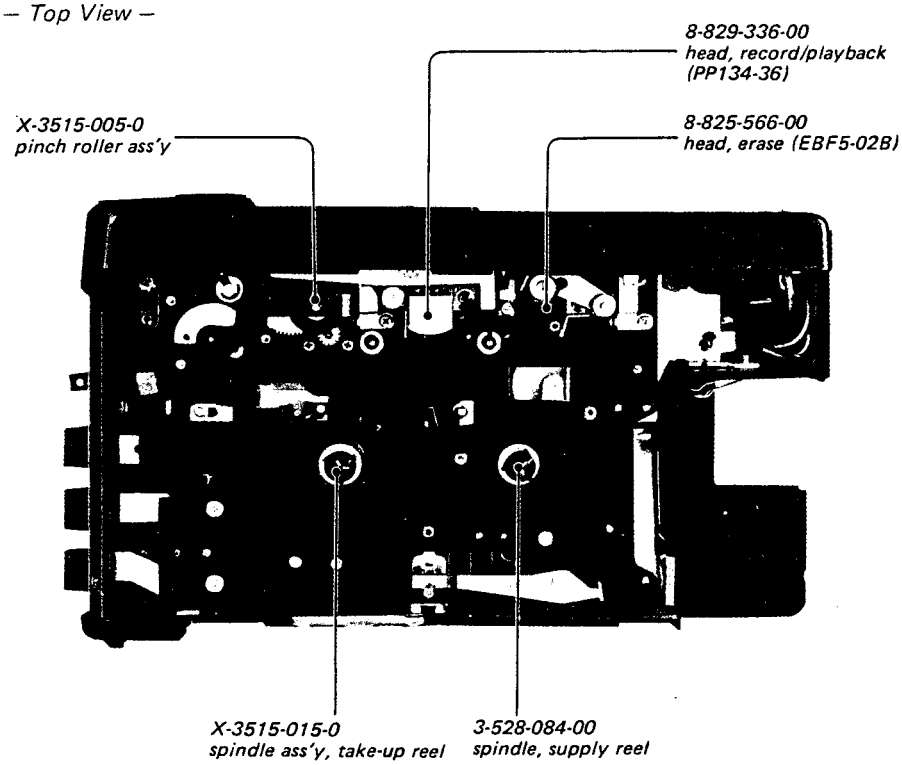
Ref	Switch	Mode
S1	record/playback	playback
S2	pause	START

1-4. EXTERNAL VIEW

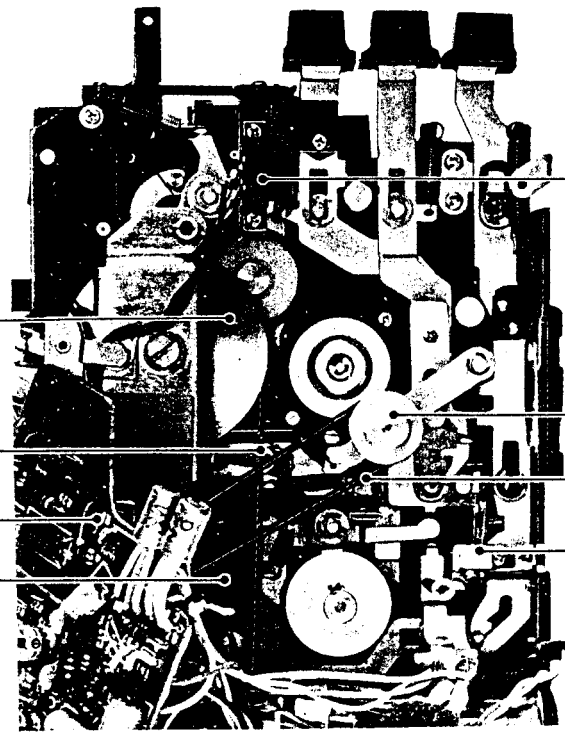


1-5. INTERNAL VIEW

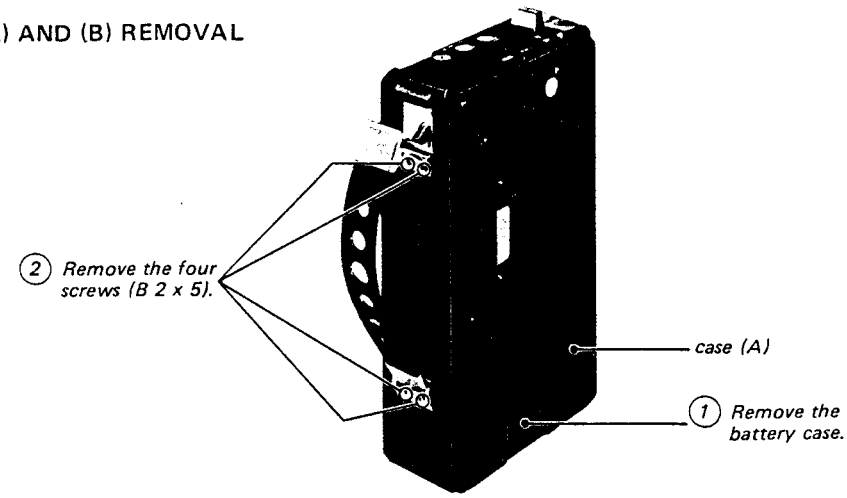
CHASSIS – Top View –

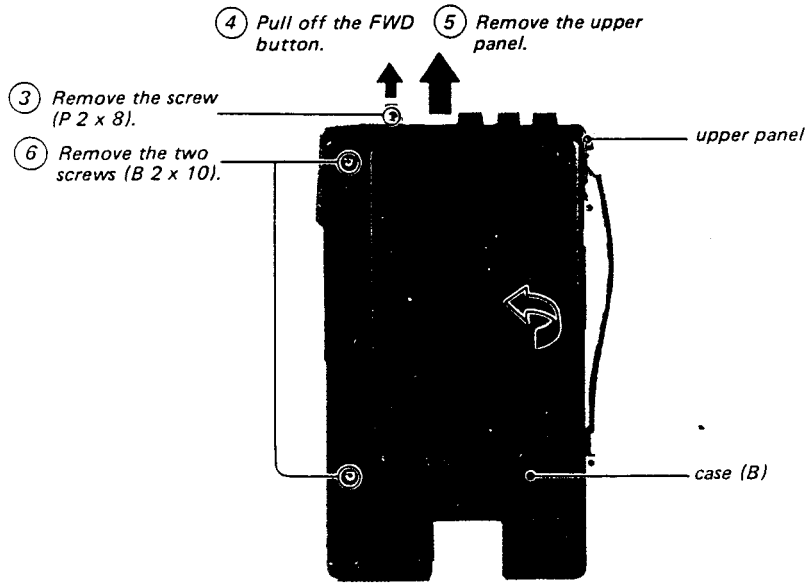


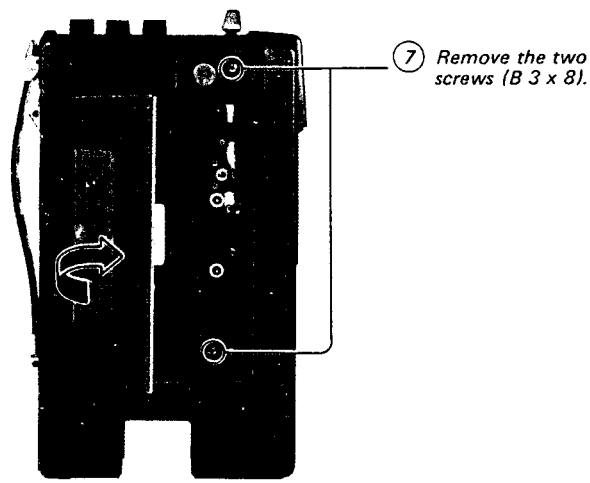
CHASSIS —Rear View—



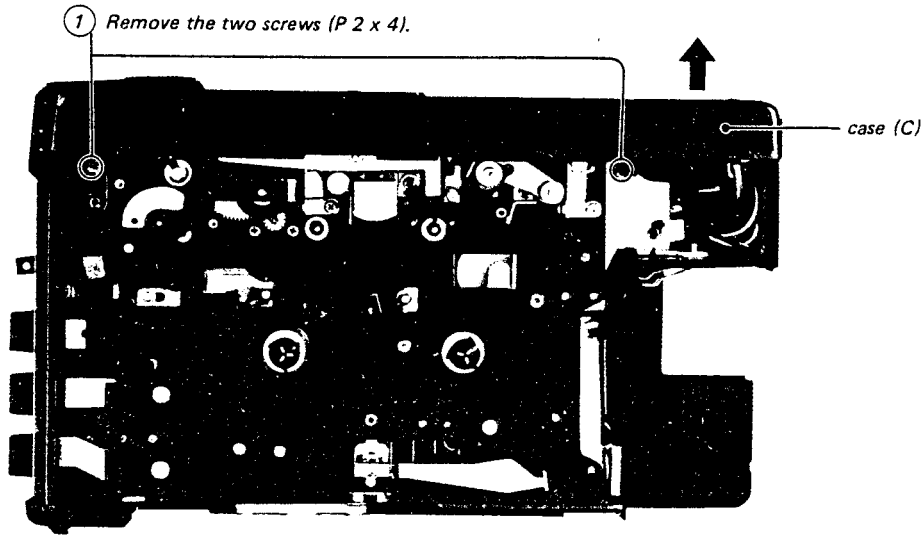
2-1. CASE (A) AND (B) REMOVAL



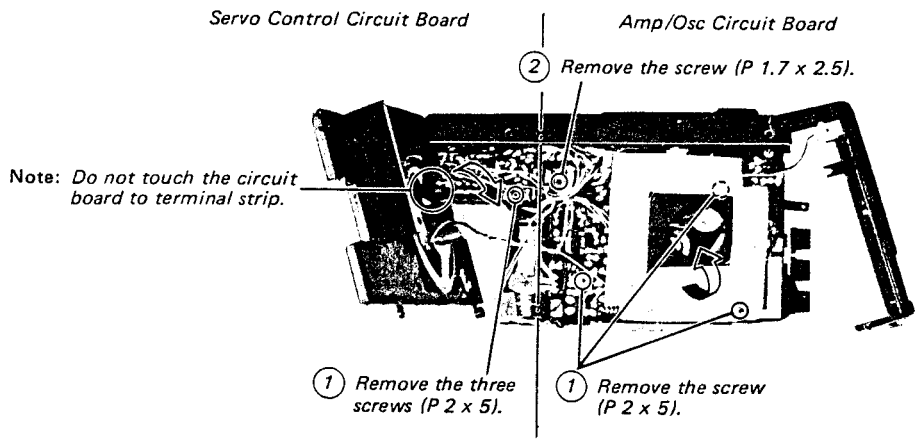




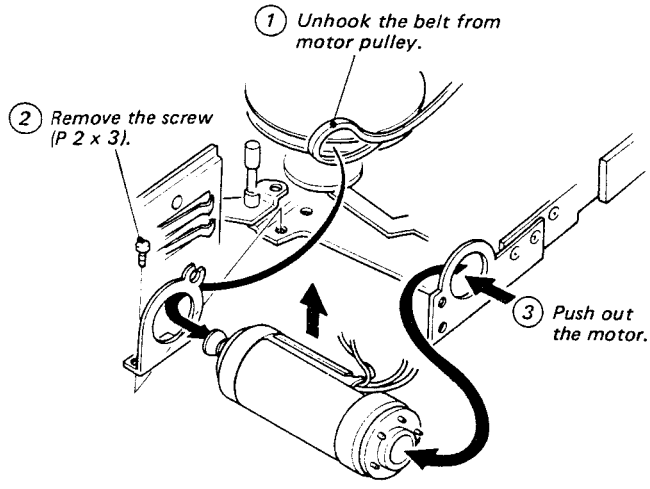
2-2. CASE (C) REMOVAL



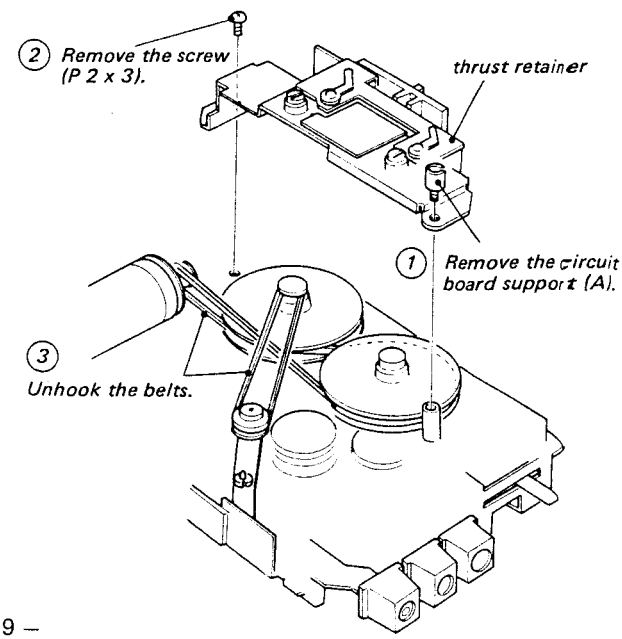
2-3. COMPLETE CIRCUIT BOARD REMOVAL


Servo Control Circuit Board
Amp/Osc Circuit Board
(2) Remove the screw (P 1.7 x 2.5).
Note: Do not touch the circuit board to terminal strip.
(1) Remove the three screws (P 2 x 5).
(1) Remove the screw (P 2 x 5).

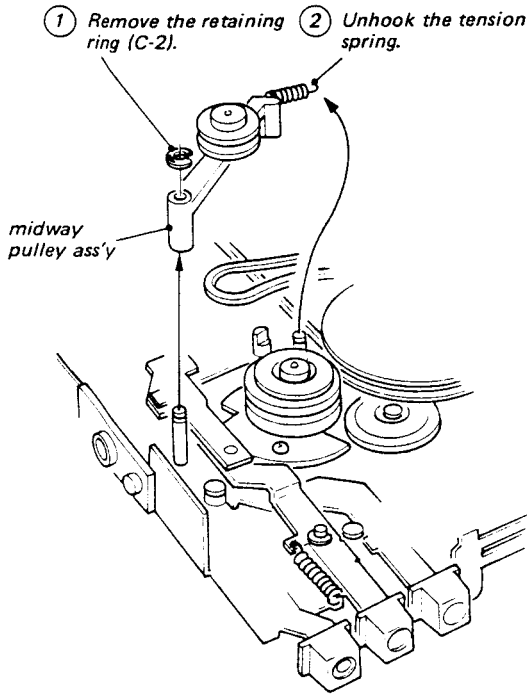
2-4. MOTOR REMOVAL



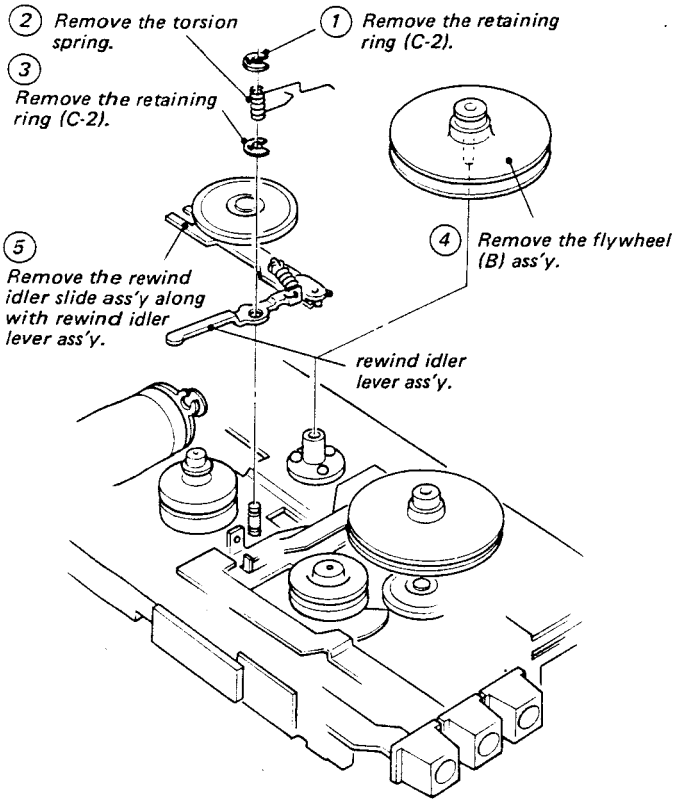
2-5. BELT REMOVAL



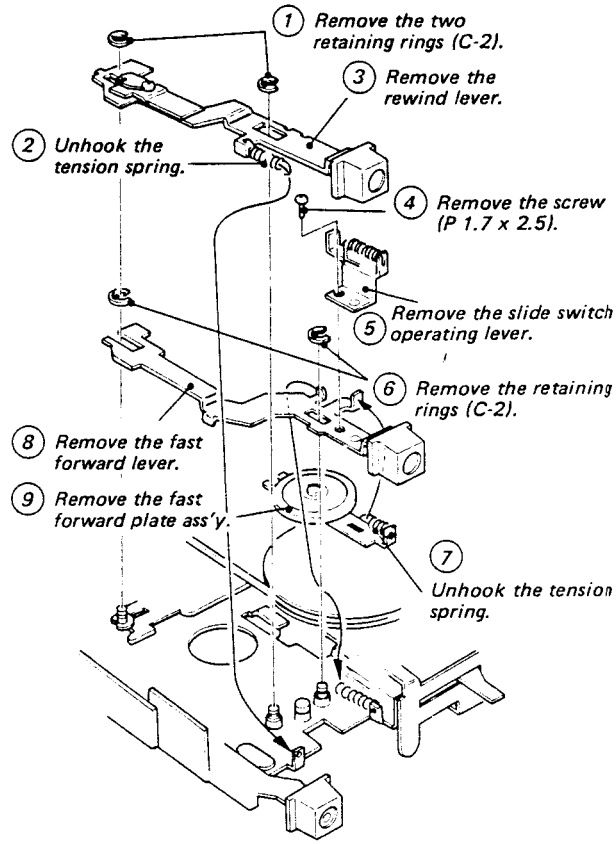
2-6. MIDWAY PULLEY REMOVAL



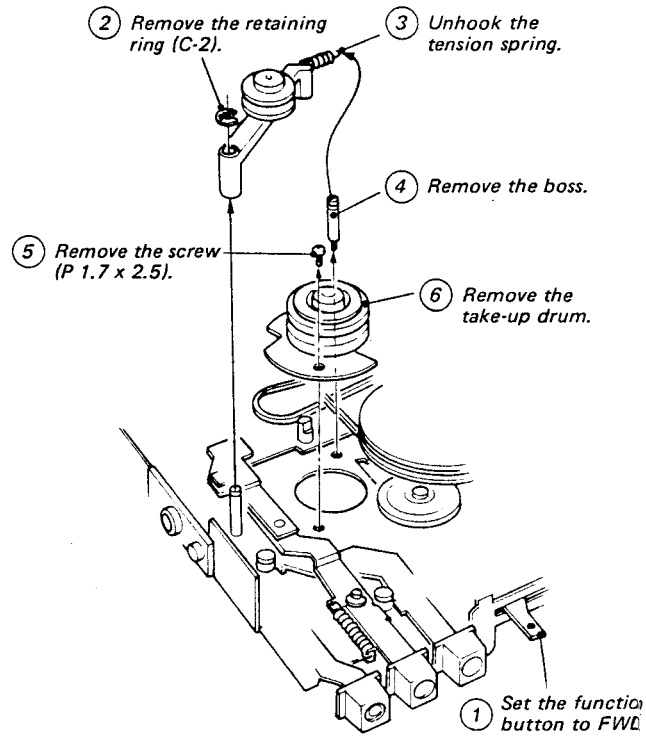
2-7. REWIND IDLER SLIDE REMOVAL


(2) Remove the torsion spring.
(1) Remove the retaining ring (C-2).
(3) Remove the retaining ring (C-2).
(5) Remove the rewind idler slide ass'y along with rewind idler lever ass'y.
(4) Remove the flywheel (B) ass'y.
rewind idler lever ass'y.

2-8. FAST FORWARD PLATE REMOVAL


(1) Remove the two retaining rings (C-2).
(3) Remove the rewind lever.
(2) Unhook the tension spring.
(4) Remove the screw (P 1.7 x 2.5).
(5) Remove the slide switch operating lever.
(6) Remove the retaining rings (C-2).
(8) Remove the fast forward lever.
(9) Remove the fast forward plate ass'y.
(7) Unhook the tension spring.

2-9. TAKE-UP DRUM REMOVAL


(2) Remove the retaining ring (C-2).
(3) Unhook the tension spring.
(4) Remove the boss.
(5) Remove the screw (P 1.7 x 2.5).
(6) Remove the take-up drum.
(1) Set the function button to FWD

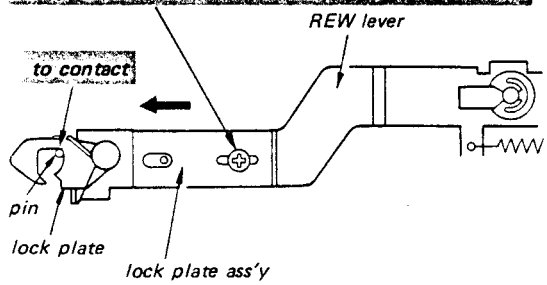
SECTION 3
ADJUSTMENTS

3-1. MECHANICAL ADJUSTMENTS

REW Lever Adjustment

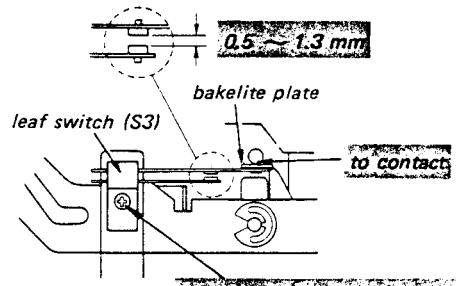
–Stop Mode–

With REW lever fully pushed as shown by the arrow, loosen this screw and adjust lock plate ass'y position.

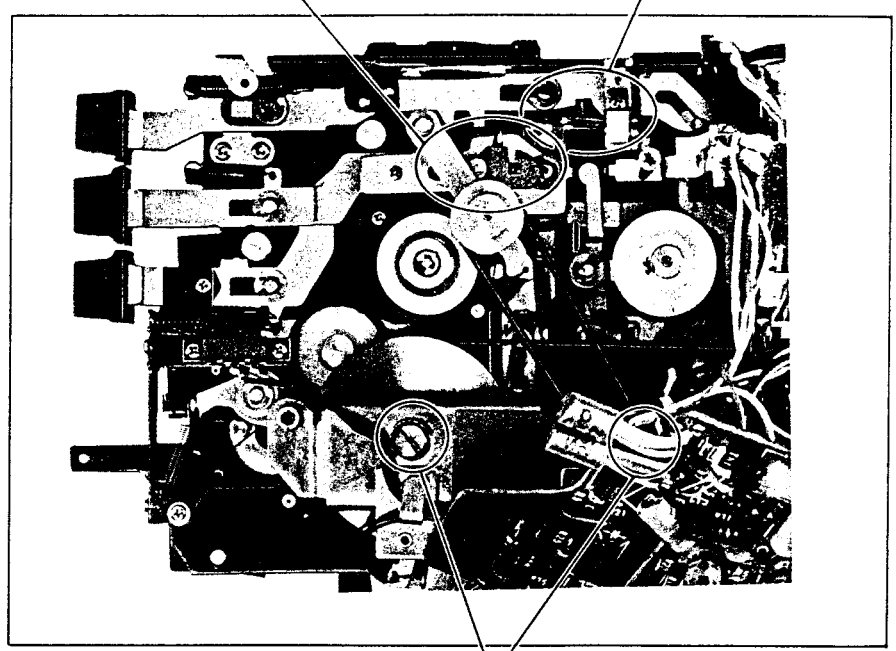


Power Leaf Switch (S3) Adjustment

–Stop Mode–



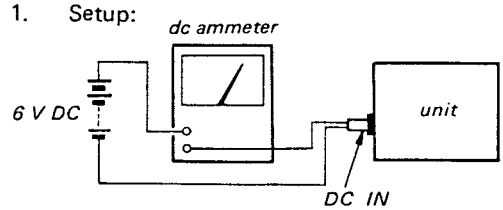
Loosen this screw and adjust leaf switch position.



Flywheel Thrust Play Adjustment

–Playback Mode–

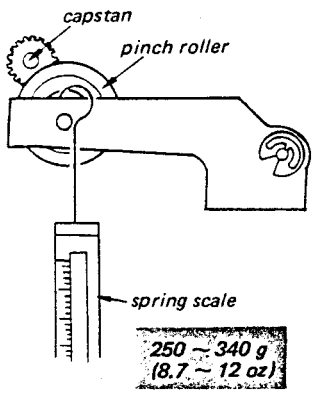
1. Setup:



2. Loosen thrust screws for sufficient fly wheel play.
3. Tighten the screws until current suddenly increases, then loosen the screws 1/4 turn.

Pinch Roller Pressure Measurement

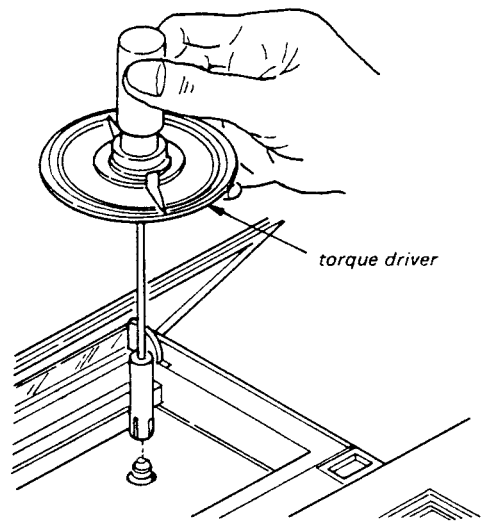
–Playback Mode–

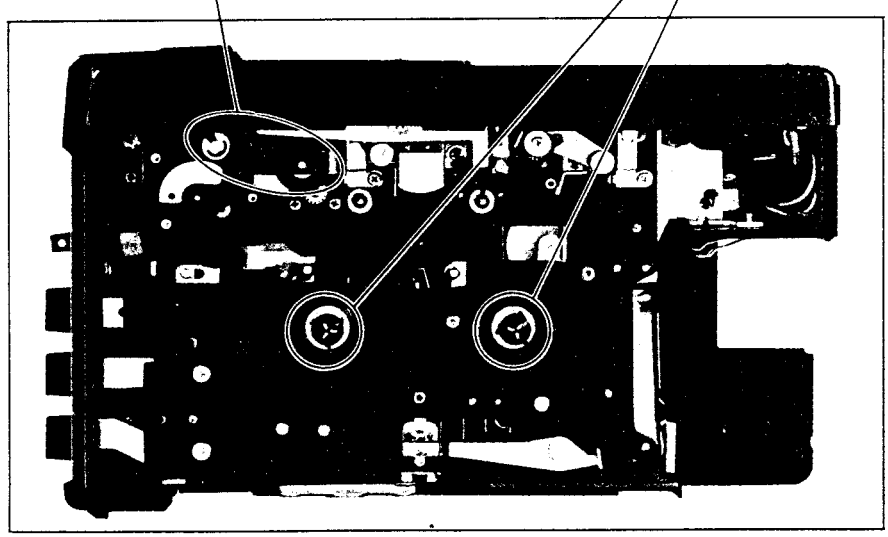


Note: The pressure should be measured just when the pinch roller contacts the capstan after separated.

Torque Measurement

Playback Torque	40 ~ 60 g.cm (0.56 ~ 0.84 oz.inch)
Fast Forward Torque	60 g.cm or more (0.84 oz. inch)
REW Torque	50 g.cm or more (0.7 oz.inch)





3-2. ELECTRICAL ADJUSTMENTS/ MEASUREMENTS

PRECAUTION

1) Clean the following parts with alcohol-moistened swab:
   - Record/Playback head
   - Erase head
   - Capstan
   - Pinch roller
   - Rubber belt
   - Idlers
2) Demagnetize record/playback head with a head demagnetizer.
   (Don't bring head demagnetizer close to erase head, and don't use magnetized screwdriver for adjustments).
3) After the adjustments, apply lock paint to the parts adjusted.
4) Adjustments should be performed in the order arranged in service manual.
5) Adjustments and measurements should be performed with rated voltage unless otherwise specified.

Test Equipment/Tools Required

audio oscillator (af osc)
VTVM
digital frequency counter
1 kHz bandpass filter
10 kΩ resistor
attenuator (600 Ω)
SONY test tapes
- P-4-A81 (6.3 kHz, −10 dB)
- P-4-L81 (333 Hz, 0 dB)
- SPC-4 (1 kHz, 0 dB)
- WS-48 (3 kHz, 0 dB)

blank tape cassette (completely erased)
empty cassette
wow meter
resistors (8 Ω, 1 W) (10 kΩ, 1/4 W) (600 Ω, 1/4 W)

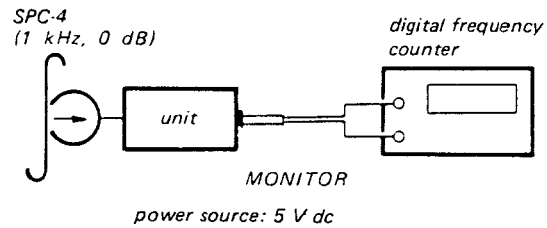
1. Tape speed Adjustment

Control/Switch Setting:

PB VOL control: mechanical midway

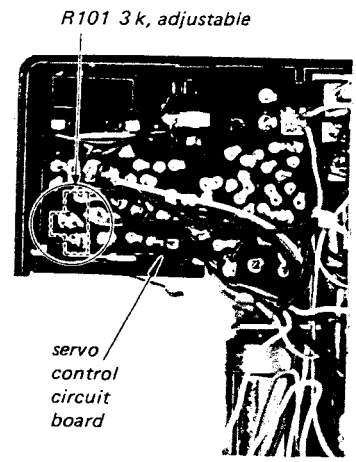
Procedure:

1. Mode: playback



Specification: 990 ~ 1000 Hz

2. If necessary, adjust R101



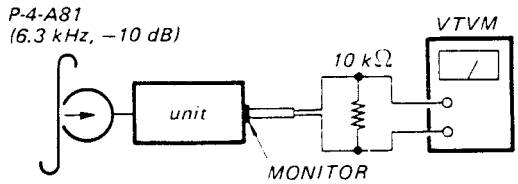
2. Head Azimuth Adjustment

Control/Switch Setting:

PB VOL control: mechanical midway

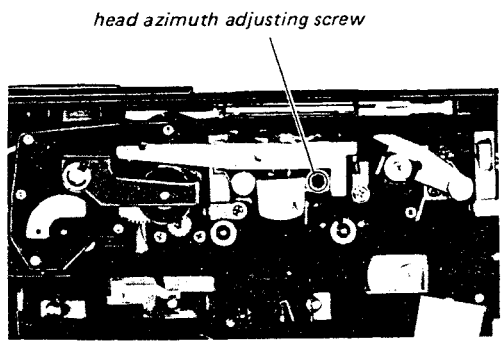
Procedure:

1. Mode: playback



2. Adjust adjusting screw for the biggest peak VTVM reading.

Note: Several peaks may appear, take the biggest.

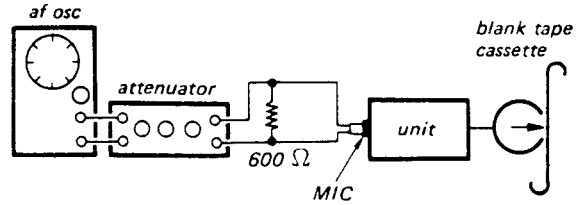


3. Recording Bias Adjustment

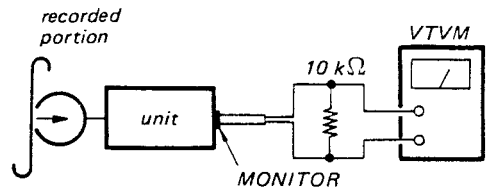
Procedure:

1. Mode: record

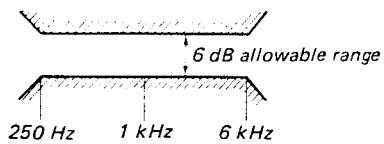
1. 1 kHz, −80 dB (77.5 μV)
2. 6 kHz, −80 dB (77.5 μV)
3. 250 Hz, −80 dB (77.5 μV)



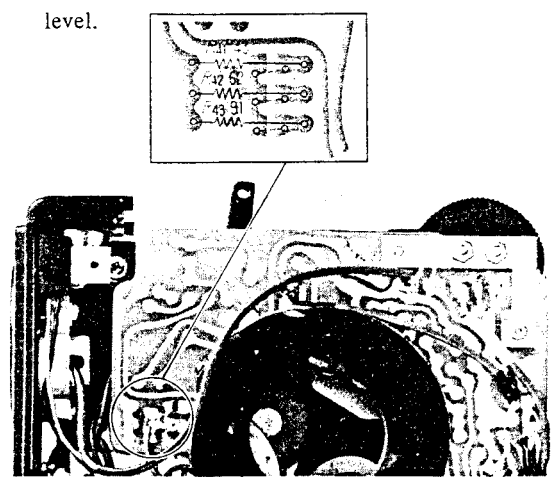
2. Mode : playback



recorded signal	VTVM reading
1 kHz	Adjust PB VOL control for −10 dB (0.25 V)
6 kHz	See figure below
250 Hz	



3. If necessary, vary resistance by changing resistor connection as shown.
Lower resistance value decreases high-frequency level.



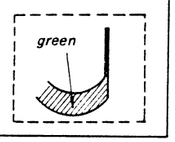
4. Repeat steps 1 through 3 until desired results are achieved.

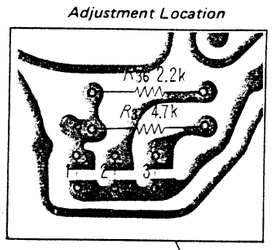
4. REC/BATT Meter Calibration

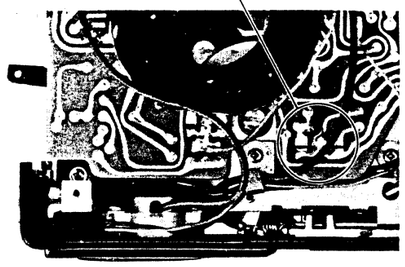
Procedure:

1. Supply 3.6 V dc and place unit in playback mode.

2.

Adjust	REC/BATT meter
Change resistor connection (See figure below)	





5. Overall Maximum Output Measurement

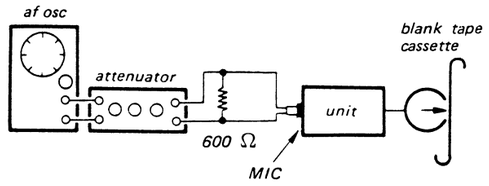
Control/Switch Setting:

PB VOL control: maximum

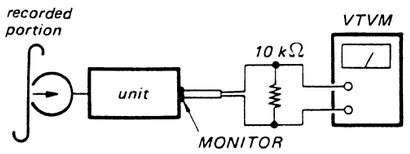
Procedure:

1. Mode: record

333 Hz, −60 dB (0.78 mV)
power source: 6 V dc



2. Mode : playback

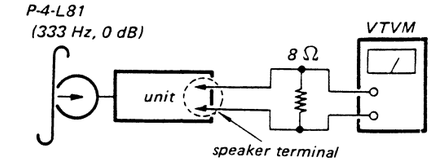


VTVM reading : greater than 1.9 V (8 dB)

6. Playback Signal-to-Noise Ratio Measurement

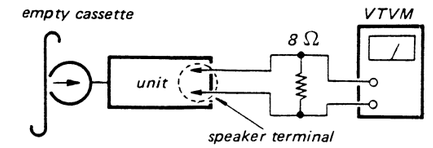
Procedure:

1. Mode: playback



Adjust PB VOL control for + 2 dB (0.95 V)

2. Mode: playback



Specification:

+2 dB − noise level (dB) = S/N

Power source	S/N
ac adaptor	greater than 36 dB
battery	greater than 42 dB

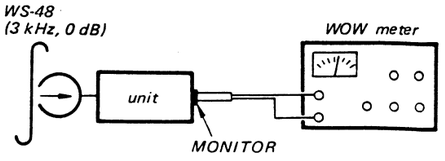
7. Wow and Flutter Measurement

Control/Switch Setting:

PB VOL control: mechanical midway

Procedure:

1. Mode: playback



Specification: less than 0.4 % (RMS)

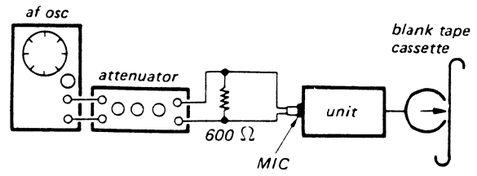
Note: Measure wow and flutter for beginning, midway and end portion of WS-48.

8. Erase Ratio Measurement

Procedure:

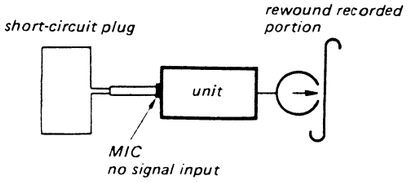
1. Mode: record

1 kHz, −20 dB (77.5 mV)

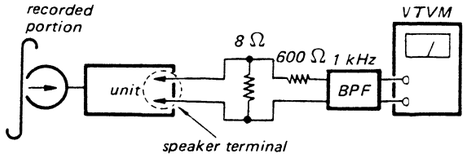


2. Rewind half of recorded portion.

3. Mode: record



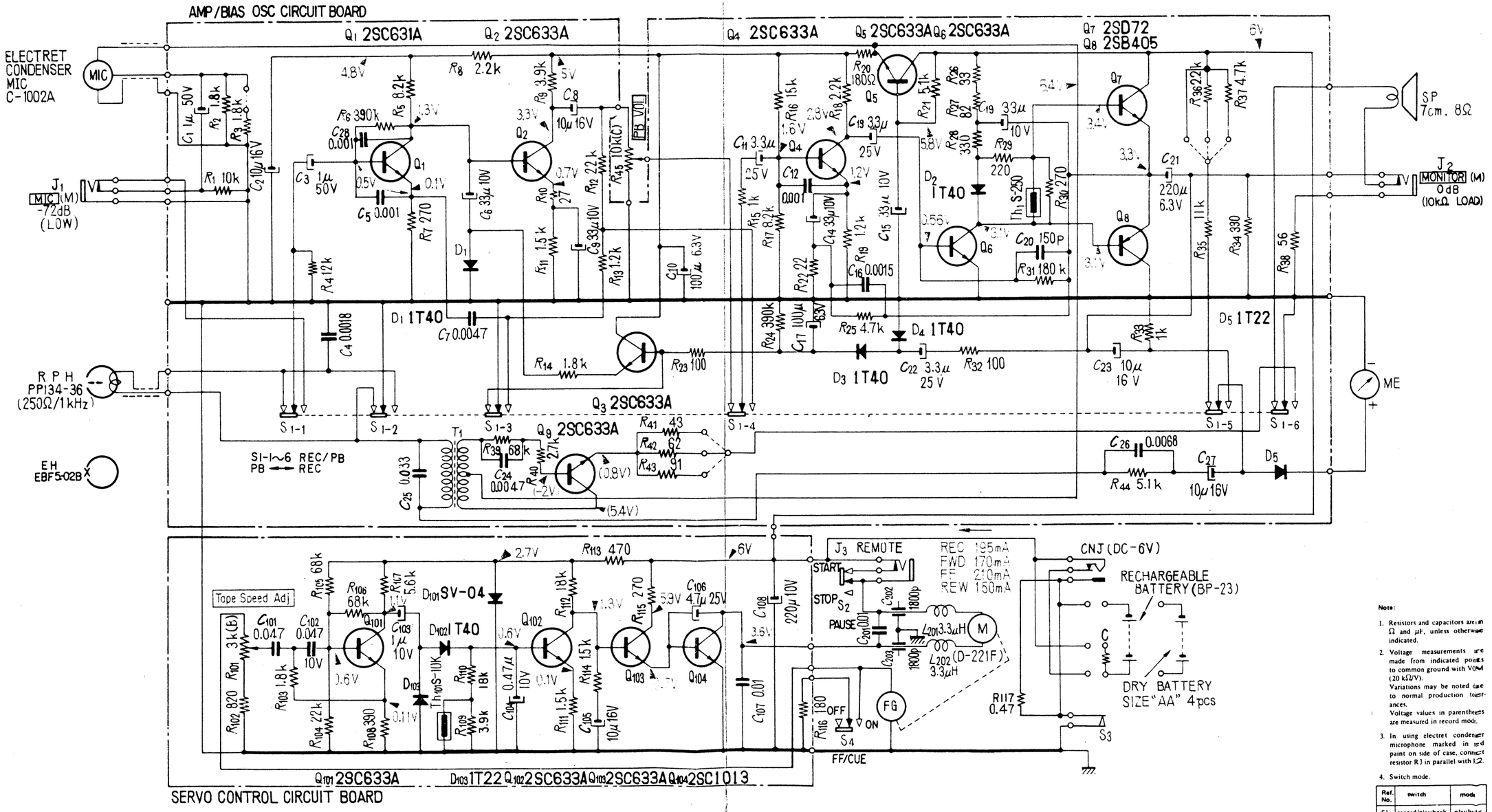
4. Mode: playback



recorded signal	VTVM reading
1 kHz (−20 dB, 77.5 mV)	Adjust PB VOL control for 0 dB (0.775 V)
no signal	less than −60 dB(0.78 m V) (erase ratio greater than 60 dB)

SECTION 4
DIAGRAMS

4-1. SCHEMATIC DIAGRAM



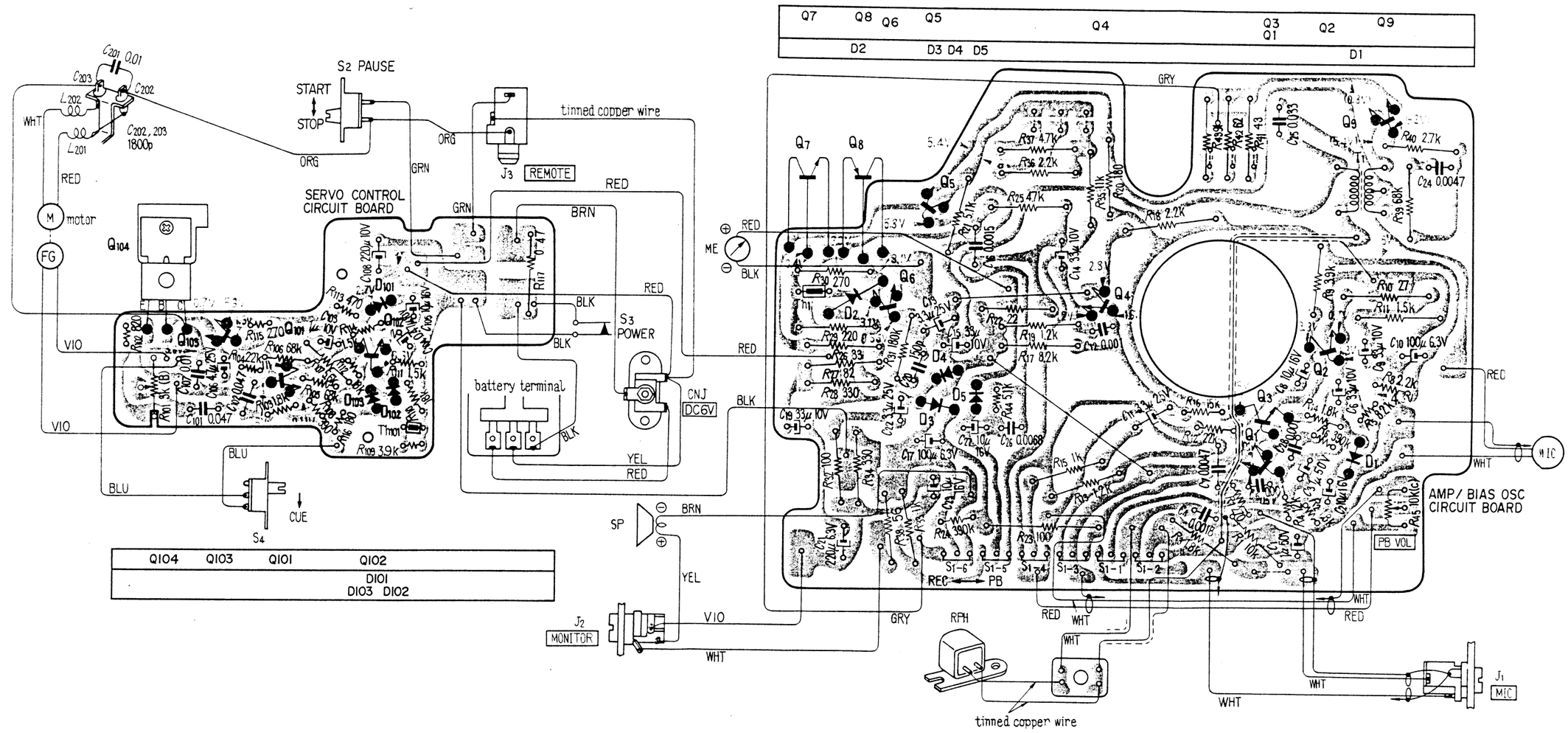
Note:

1. Resistors and capacitors are in Ω and μF, unless otherwise indicated.
2. Voltage measurements are made from indicated points to common ground with VOM (20 kΩ/V).
   Variations may be noted due to normal production tolerances.
   Voltage values in parentheses are measured in record mode.
3. In using electret condenser microphone marked in red paint on side of case, connect resistor R3 in parallel with it.
4. Switch mode.

Ref. No.	switch	mode
S1	record/playback	playback
S2	pause	START
S3	power	OFF
S4	CUE	OFF

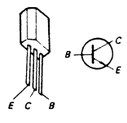
4-2. MOUNTING DIAGRAMS

– Conductor Side –

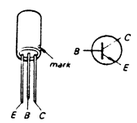


Q1: 2SC631A

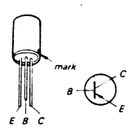
Q2 ~ 6, 9, Q101 ~ 103 } *2SC633A*



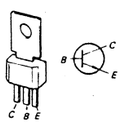
Q7: 2SD72



Q8: 2SB405

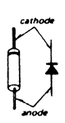


Q104: 2SC1013

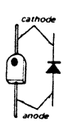


D1 ~ 4, 102: 1T40

D5, 103: 1T22

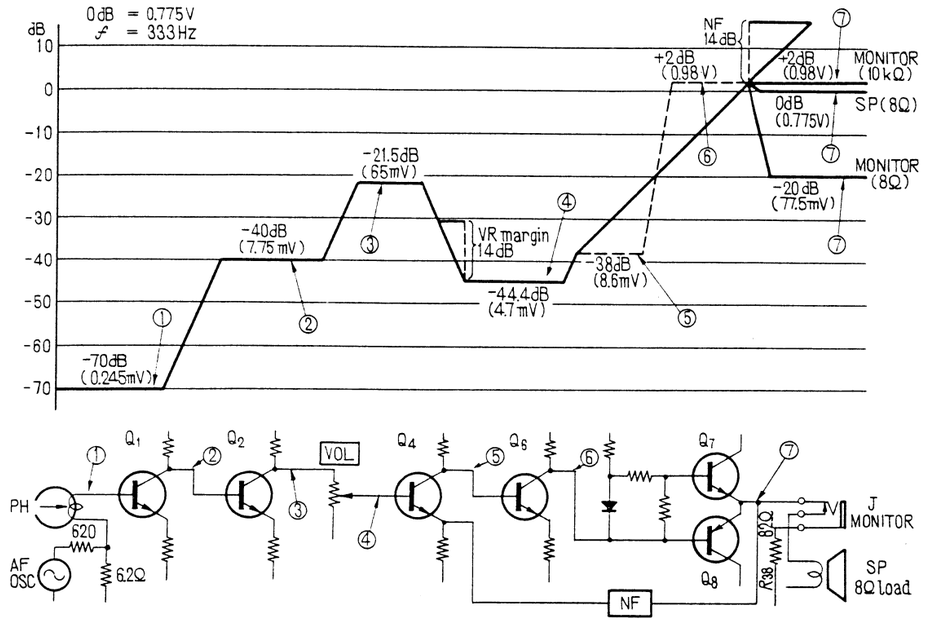


D101: SV-04

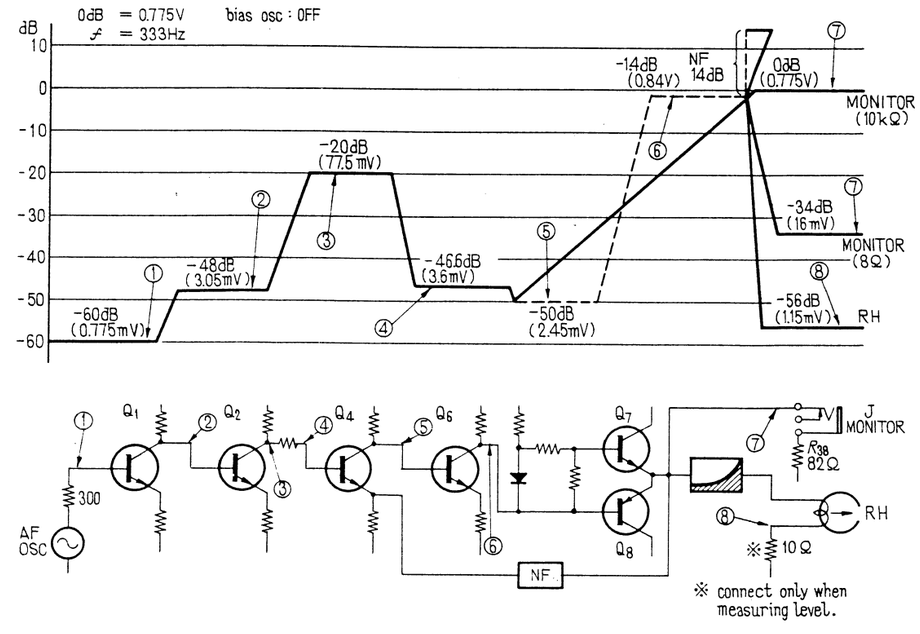


4-3. LEVEL DIAGRAM

Playback



Record



SECTION 5
EXPLODED VIEWS AND PACKING

Part No.	Description
	SCREWS
7-621-255-13	⊕ P 2 x 3
7-621-255-23	⊕ P 2 x 4
7-621-255-33	⊕ P 2 x 5
7-621-255-43	⊕ P 2 x 6
7-621-255-53	⊕ P 2 x 8
7-621-255-63	⊕ P 2 x 12
7-621-281-13	⊕ P 2 x 2
7-621-500-53	⊕ P 1.7 x 2.5
7-621-555-25	⊕ K 2 x 4
7-621-714-16	⊖ SC 1.7 x 3
7-621-771-18	⊕ B 2 x 5
7-621-773-82	⊕ B 2 x 6
7-621-774-21	⊕ B 2 x 6
7-627-600-53	⊕ K 1.7 x 3
7-627-800-93	⊕ P 1.7 x 4
7-682-527-05	⊕ B 2 x 8 (BLK)
7-682-528-05	⊕ B 2 x 10 (BLK)
7-682-635-01	⊕ PS 2.6 x 6
7-685-105-21	⊕ P 2 x 8, self-tapping
7-685-132-21	⊕ P 2.6 x 5, self tapping

Part No.	Description
	WASHERS
7-623-104-12	1.7 mm dia (middle)
7-623-105-12	2 mm dia (middle)
7-623-108-12	3 mm dia (middle)
7-623-205-22	2 mm dia, spring
7-623-205-27	2 mm dia, spring
7-623-405-06	2 mm dia, external tooth
	RETAINING RINGS
7-624-106-01	E-3 mm dia
7-624-122-11	C-1.5 mm dia
7-624-124-11	C-2 mm dia
	NUTS
7-622-105-05	2 mm dia
7-622-107-05	2.6 mm dia
	STEEL BALL
7-671-112-01	2 mm dia

Hardware Nomenclature

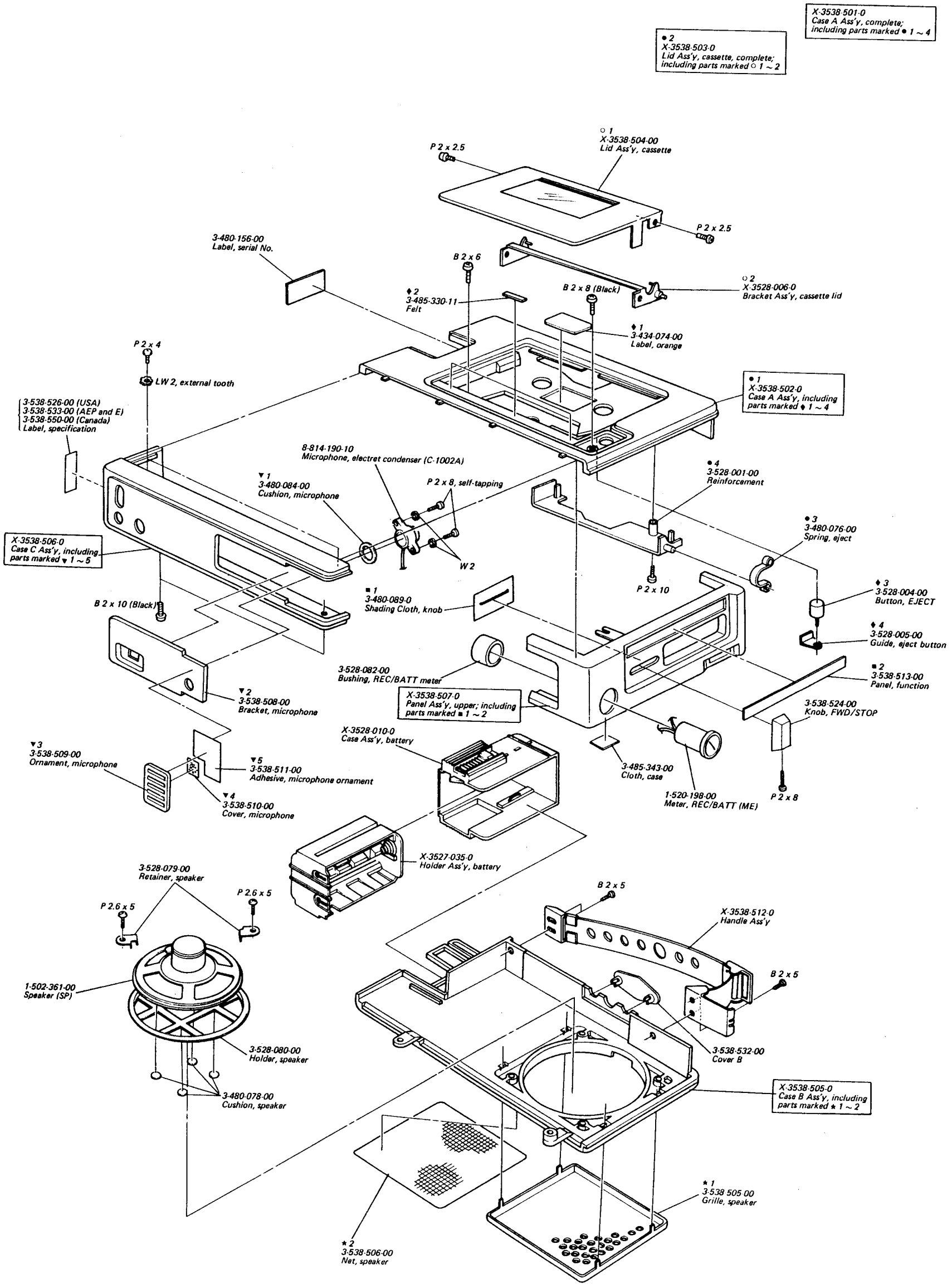
P – Pan Head Screw ⊕
PS – Pan Head Screw with Spring Washer ⊕
K – Flat Countersunk Head Screw ⊕
B – Binding Head Screw ⊕
RK – Oval Countersunk Head Screw ⊕
T – Truss Head Screw ⊕
R – Round Head Screw ⊕
F – Flat Fillister Head Screw ⊖

SC – Set Screw ⊖
E – Retaining Ring (E Washer)

W – Washer
SW – Spring Washer
LW – Lock Washer
N – Nut

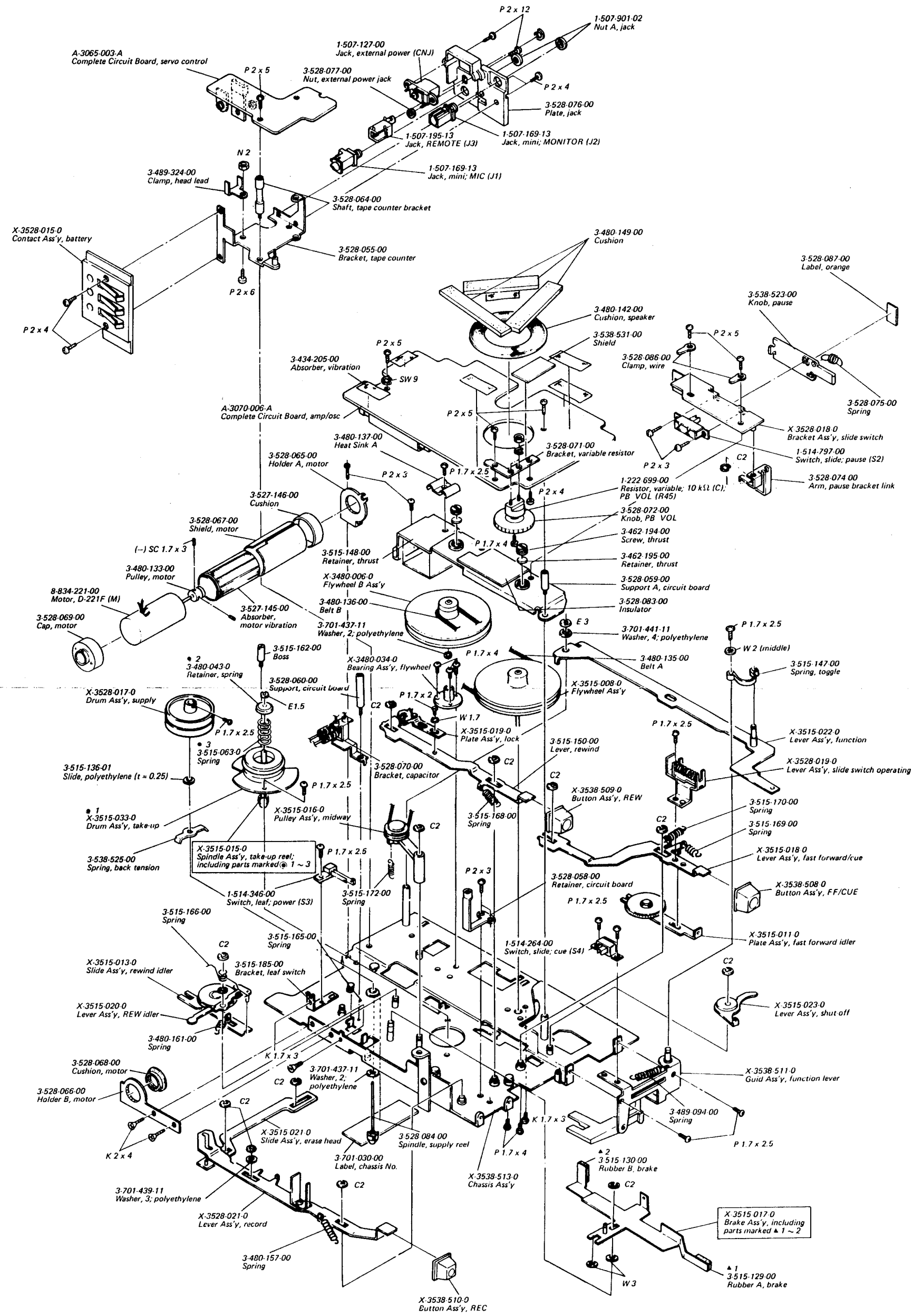
– Example –

⊕ P 3×10
- Type of Slot
- Length in mm (L)
- Diameter in mm (D)
- Type of Head



Note: 1. Parts without part numbers and names are not available.

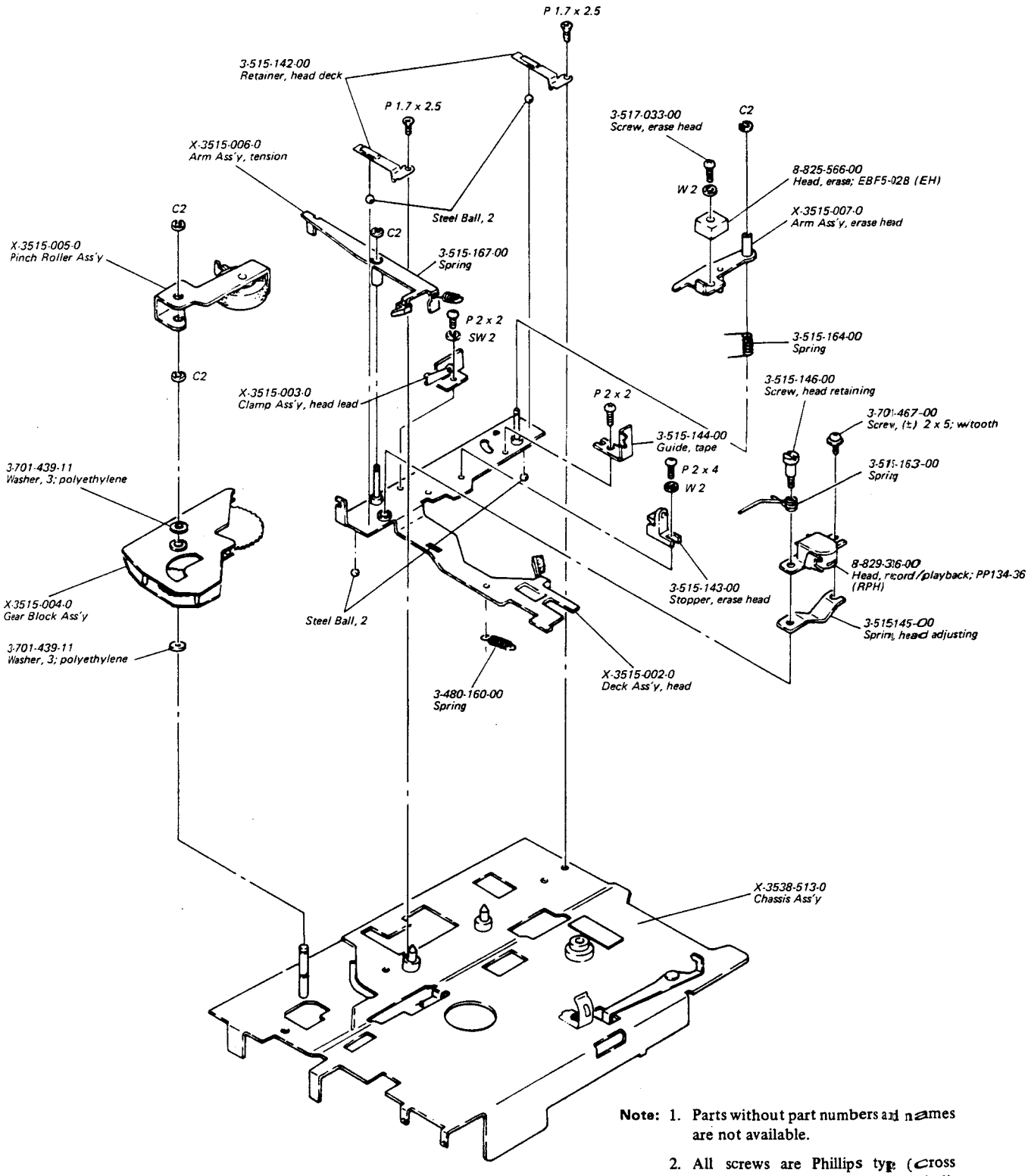
2. All screws are Phillips type (cross recess type) unless otherwise indicated.
(−): slotted head



Note: 1. Parts without part numbers and names are not available.

2. All screws are Phillips type (cross recess type) unless otherwise indicated.
(–): slotted head

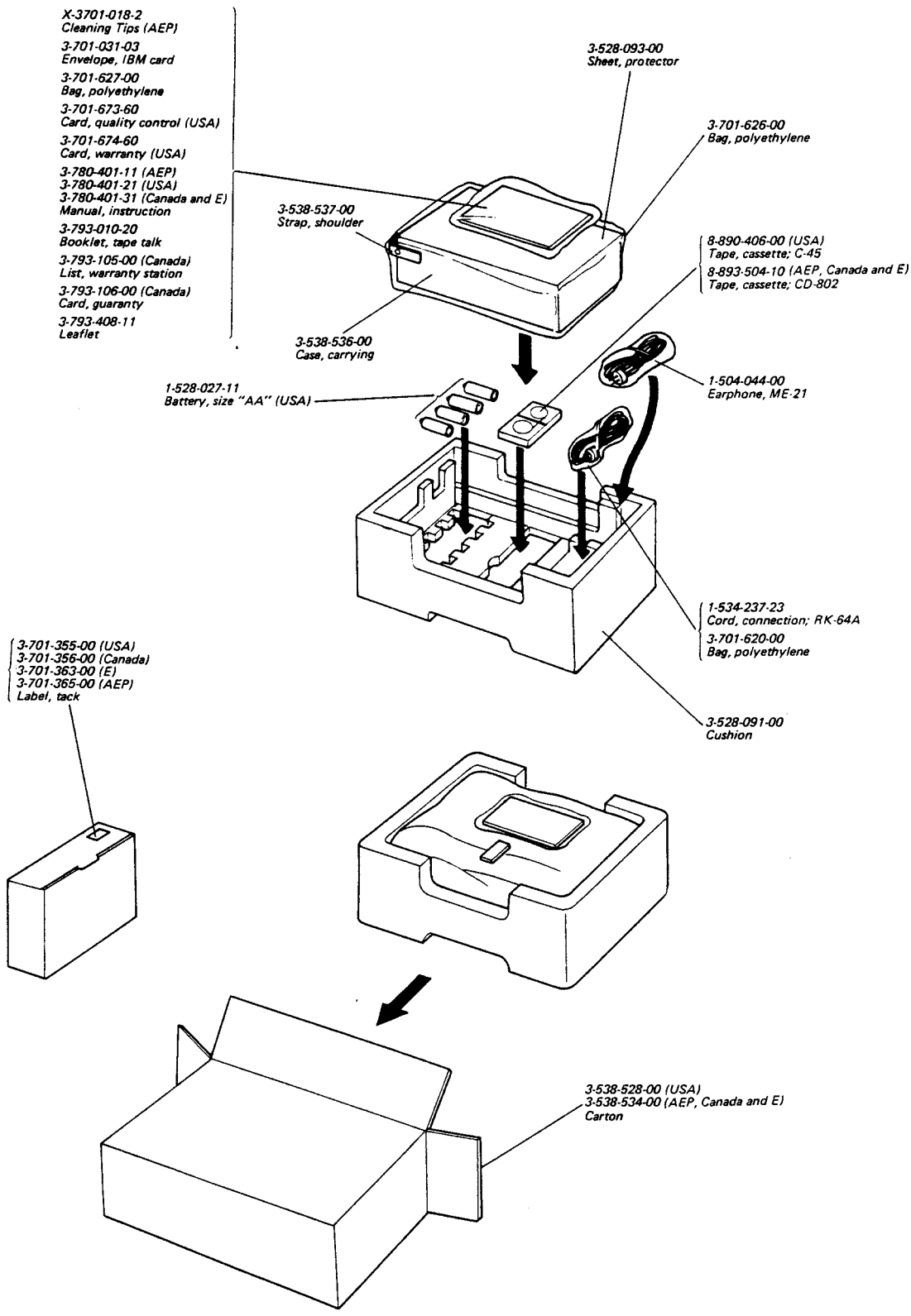
5-3. EXPLODED VIEW (3)



Note: 1. Parts without part numbers and names are not available.

2. All screws are Phillips type (cross recess type) unless otherwise indicated.
(–): slotted head

5-4. PACKING



Note: 1. Parts without part numbers and names are not available.

SECTION 6

ELECTRICAL PARTS LIST

COMPLETE CIRCUIT BOARDS

Ref. No.	Part No.	Description
	A-3070-006-A	amp/bias osc
	A-3065-003-A	servo control

SEMICONDUCTORS

Ref. No.	Part No.	Description
Q1		transistor 2SC631A
Q2		transistor 2SC633A
Q3		transistor 2SC633A
Q4		transistor 2SC633A
Q5		transistor 2SC633A
Q6		transistor 2SC633A
Q7		transistor 2SD72
Q8		transistor 2SB405
Q9		transistor 2SC633A
Q101		transistor 2SC633A
Q102		transistor 2SC633A
Q103		transistor 2SC633A
Q104		transistor 2SC1013
D1		diode 1T40
D2		diode 1T40
D3		diode 1T40
D4		diode 1T40
D5		diode 1T22
D101		diode SV-04
D102		diode 1T40
D103		diode 1T22
Th1		thermistor S-250
Th101		thermistor S-10k

COILS and TRANSFORMER

Ref. No.	Part No.	Description
L201	1-407-484-00	coil, micro inductor : 3.3 μH
L202	1-407-484-00	coil, micro inductor : 3.3 μH
T1	1-433-105-00	transformer, bias osc

CAPACITORS

All capacitors are in μF unless otherwise indicated.
(p = μμ, elect = electrolytic)

Ref. No.	Part No.		
C1	1-121-391-11	1	50 V elect
C2	1-121-651-11	10	16 V elect
C3	1-121-391-11	1	50 V elect
C4	1-105-664-12	0.0018	50 V mylar
C5	1-101-918-11	0.001	25 V ceramic
C6	1-121-402-11	33	10 V elect
C7	1-105-669-12	0.0047	50 V mylar
C8	1-121-651-11	10	16 V elect
C9	1-121-402-11	33	10 V elect
C10	1-121-413-11	100	6.3 V elect
C11	1-121-392-11	3.3	25 V elect
C12	1-101-918-11	0.001	25 V ceramic
C13	1-121-392-11	3.3	25 V elect
C14	1-121-402-11	33	10 V elect
C15	1-121-402-11	33	10 V elect
C16	1-105-663-12	0.0015	50 V mylar
C17	1-121-413-11	100	6.3 V elect
C18		.....	
C19	1-121-402-11	33	10 V elect
C20	1-102-108-11	150 p	50 V ceramic
C21	1-121-419-11	220	6.3 V elect
C22	1-121-392-11	3.3	25 V elect
C23	1-121-651-11	10	16 V elect
C24	1-105-669-12	0.0047	50 V mylar
C25	1-105-679-12	0.033	50 V mylar
C26	1-105-671-12	0.0068	50 V mylar
C27	1-121-651-11	10	16 V elect
C28	1-101-918-11	0.001	25 V ceramic
C101	1-105-681-12	0.047	50 V mylar
C102	1-105-681-12	0.047	50 V mylar
C103	1-127-023-11	1	10 V solid aluminum
C104	1-127-022-11	0.47	10 V solid aluminum
C105	1-121-651-11	10	16 V elect
C106	1-121-961-11	4.7	25 V elect
C107	1-105-833-12	0.01	50 V mylar
C108	1-121-420-11	220	10 V elect
C201	1-105-833-12	0.01	50 V mylar
C202	1-101-599-15	1800 p	50 V ceramic, feed-through
C203	1-101-599-15	1800 p	50 V ceramic, feed-through

RESISTORS

All resistors are ¼ W, composition type and in Ω unless otherwise indicated. (k = 1000)

Ref. No.	Part No.		
R1	1-244-497-12	10 k	1/8 W carbon
R2	1-244-479-12	1.8 k	1/8 W carbon
R3	1-244-479-12	1.8 k	1/8 W carbon
R4	1-244-499-12	12 k	1/8 W carbon
R5	1-244-495-12	8.2 k	1/8 W carbon
R6	1-244-535-12	390 k	1/8 W carbon
R7	1-244-459-12	270	1/8 W carbon
R8	1-202-391-11	2.2 k	
R9	1-202-397-11	3.9 k	
R10	1-202-335-11	27	
R11	1-202-387-11	1.5 k	
R12	1-202-415-11	22 k	
R13	1-202-385-11	1.2 k	

Ref. No.	Part No.		Description
R14	1-202-389-11	1.8 k	
R15	1-244-473-12	1 k	1/8 W carbon
R16	1-244-501-12	15 k	1/8 W carbon
R17	1-244-495-12	8.2 k	1/8 W carbon
R18	1-202-391-11	2.2 k	
R19	1-244-475-12	1.2 k	1/8 W carbon
R20	1-202-365-11	180	
R21	1-202-400-11	5.1 k	
R22	1-202-333-11	22	
R23	1-202-359-11	100	
R24	1-202-445-11	390 k	
R25	1-202-399-11	4.7 k	
R26	1-202-337-11	33	
R27	1-202-357-11	82	
R28	1-202-371-11	330	
R29	1-202-367-11	220	
R30	1-202-369-11	270	
R31	1-202-437-11	180 k	
R32	1-202-359-11	100	
R33	1-202-383-11	1 k	
R34	1-202-371-11	330	
R35	1-202-408-11	11 k	
R36	1-202-391-11	2.2 k	
R37	1-202-399-11	4.7 k	
R38	1-202-343-11	56	
R39	1-202-427-11	68 k	
R40	1-202-393-11	2.7 k	
R41	1-202-340-11	43	
R42	1-202-344-11	62	
R43	1-202-358-11	91	
R44	1-202-400-11	5.1 k	
R45	1-222-699-00	10 k (C), variable : PB VOL	
R101	1-221-320-00	3 k, adjustable: Tape Speed ADJ.	
R102	1-201-272-11	820	1/8 W
R103	1-201-650-11	1.8 k	1/8 W
R104	1-201-867-11	22 k	1/8 W
R105	1-202-091-11	68 k	1/8 W
R106	1-202-091-11	68 k	1/8 W
R107	1-202-027-11	5.6 k	1/8 W
R108	1-202-823-11	390	1/8 W
R109	1-202-017-11	3.9 k	1/8 W
R110	1-202-059-11	18 k	1/8 W
R111	1-202-644-11	1.5 k	1/8 W
R112	1-202-059-11	18 k	1/8 W
R113	1-201-453-11	470	1/8 W
R114	1-201-643-11	1.5 k	1/8 W
R115	1-201-996-11	270	1/8 W
R116	1-201-829-11	180	1/8 W
R117	1-217-418-11	0.47	metal oxide, fuse

SWITCHES

S1	1-514-861-22	slide, record/playback
S2	1-514-797-00	slide, pause
S3	1-514-346-00	leaf, power
S4	1-514-264-00	slide, cue

JACKS

CNJ	1-507-127-00	external power
J1	1-507-169-13	mini, MIC
J2	1-507-169-13	mini, MONITOR
J3	1-507-195-13	REMOTE

MISCELLANEOUS

RPH	8-829-336-00	head, record/playback (PP134-36)
EH	8-825-566-00	head, erase (EBF5-02B)
M	8-834-221-00	motor (D221F)
MIC	8-814-190-10	electret condenser microphone (C1002A)
ME	1-520-198-00	meter, REC/BATT
SP	1-502-361-00	speaker
	1-507-901-02	nut (A), jack

4
CO588-1

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